

NMDCAT

FULL LENGTH PAPER-1

QUARTER SYLLABUS - 1

Total MCQs: 200

BIOLOGY

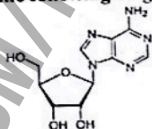
Max. Marks: 200

- Q.1** Most of the cellular machinery in human cells is in the:
- (a) Nucleus (b) Cytoplasm
(c) Plasma membrane (d) Mitochondria
- Q.2** Lipid molecules of plasma membrane are arranged:
- (a) Alternately (b) In series
(c) In parallel fashion (d) In scattered form
- Q.3** Membrane proteins are held in the bilayer mainly by:
- (a) Hydrophobic attraction (b) Covalent bonds
(c) Hydrophilic attraction (d) Ionic bonds
- Q.4** Structure of plasma membrane is shown in the following figure. Here 'X' indicates:



- (a) Glycoprotein
(c) Cholesterol tail
(b) Peripheral protein
(d) Cytoskeleton
- Q.5** Cells having secretory function have abundant:
- (a) Lysosomes (b) Endoplasmic reticulum
(c) Dictyosomes (d) Osteosomes
- Q.6** The size of microtubule is:
- (a) 4.5nm (b) 10nm
(c) 20nm (d) 25nm
- Q.7** Mitochondria is a semi-autonomous organelle because it contains:
- (a) Proteins (b) DNA and RNA
(c) RNA and ribosomes (d) DNA, mRNA and ribosomes
- Q.8** If we separate the cell organelles of a living cell, then which part should be alive?
- (a) Ribosome (b) Cell wall
(c) Chloroplast (d) Endoplasmic reticulum
- Q.9** Ribosomes are classified according to their:
- (a) Sedimentation rate (b) Size
(c) Weight (d) Volume
- Q.10** The function of centrosome is:
- (a) To increase protein synthesis (b) Inhibition of cell division
(c) Initiates cell division (d) Duplication of chromosome
- Q.11** Which statement about prokaryotes is correct?
- (a) They have membrane bound organelles
(b) They are all autotrophic
(c) They possess a cell wall and a nucleus with a double membrane
(d) They reproduce asexually but genetic recombination does occur
- Q.12** Ribosomes in the chloroplasts of eukaryotic cells are:
- (a) The same size and composition as in bacteria
(b) Smaller than in bacteria and different in composition
(c) Larger than in bacteria but of similar composition
(d) The same size but completely different in composition from the ribosomes in bacteria
- Q.13** Which pair of structures is usually found in both plant and animal cells?
- (a) Cell membrane and nucleolus (b) Nucleolus and chloroplast
(c) Cell membrane and cell wall (d) Nucleus and cell wall

- Q.14 Which of the following affects the association and dissociation of sub-units of ribosomes?
 (a) Mg^{+2} (b) Fe^{+2}
 (c) Ca^{+2} (d) K^{+}
- Q.15 Cell secretions are the products formed on _____, processed in _____ and secreted through _____.
 (a) SER, Golgi apparatus, vesicles (b) Ribosomes, Golgi apparatus, vesicles
 (c) Golgi apparatus, lysosome, cell membrane (d) RER, SER, lysosomes
- Q.16 It is true about arrangement of microtubules in a centriole:
 (a) 9×0 (b) 9×3
 (c) 9×3 (d) 9×2
- Q.17 1,4 glycosidic linkage is found in all of the following except:
 (a) Sucrose (b) Maltose
 (c) Lactose (d) Amylopectin
- Q.18 The reducing sugars are so called because they can _____ electron/s.
 (a) Donate (b) Share
 (c) Gain (d) Excite
- Q.19 Which of the following is not true for monosaccharides?
 (a) $(CH_2O)_n$ (b) Soluble
 (c) $n = 3 - 7$ (d) Hydrolysable
- Q.20 Number of amino acids in 5 turns of α -helix:
 (a) 3.6 (b) 18
 (c) 6 (d) 36
- Q.21 Which one will be at tertiary structural level?
 (a) Haemoglobin (b) Myoglobin
 (c) Fibrin (d) Keratin
- Q.22 Carboxylic group is found in:
 (a) Fatty acids only (b) Fatty acids and amino acids
 (c) Amino acids only (d) Fatty acids, amino acids and nucleic acids
- Q.23 How many water molecules are consumed during the formation of one lecithin molecule?
 (a) 0 (b) 3
 (c) 2 (d) 4
- Q.24 Which one is correct about the following diagram?



- (a) It is a nucleotide (b) It is used to form DNA
 (c) It contains pyrimidine nitrogen (d) It is used to form RNA
- Q.25 Which statement correctly describes messenger RNA?
 (a) mRNA binds amino acids for incorporation into proteins
 (b) mRNA is a double stranded helix
 (c) mRNA contains the five-carbon sugar deoxyribose
 (d) mRNA recognizes the anti-codon of tRNA
- Q.26 When apoenzyme is separated from its metal component, its activity is:
 (a) Decreased (b) Increased
 (c) Lost (d) Remains unaffected
- Q.27 Which of the following may act as coenzyme?
 (a) Dipeptide (b) Dinucleotide
 (c) Disulphide (d) Disaccharide
- Q.28 Optimum pH value for the working of arginase is:
 (a) 5.50 (b) 9.00
 (c) 7.60 (d) 9.70
- Q.29 It is not true about coenzyme and activator:
 (a) Both are formed by vitamins (b) Both are detachable
 (c) Both are non-protein parts (d) Both are required in small amount

- Q.30** The activity of some enzymes is controlled by certain molecules binding to some specific area other than active site. This site is called as:
- (a) Allosteric site (b) Globular part
(c) Binding site (d) Catalytic site
- Q.31** Location of phytol tail of chlorophyll 'b' is:
- (a) Stroma (b) Thylakoid membrane
(c) Thylakoid surface (d) Thylakoid lumen
- Q.32** PS-I is named as it:
- (a) Absorbs wavelength of 680 nm (b) Discovered earlier than PS-II
(c) Absorbs wavelength of 700 nm (d) Slightly located upward than PS-II
- Q.33** Following is correct sequence of energy transfer between photosynthetic pigments:
- (a) Chl. 'a' → Chl. 'b' → Carotenoids (b) Carotenoids → Chl. 'b' → Chl. 'a'
(c) Chl. 'b' → Carotenoids → Chl. 'a' (d) In any direction
- Q.34** Spectrophotometer is used to measure:
- (a) Absorption of CO_2 (b) Absorption of O_2
(c) Reflection of pigments (d) Absorption of different wavelengths
- Q.35** During cyclic photophosphorylation, electrons pass from all except:
- (a) Photosystem I (b) Ferredoxin
(c) Photosystem II (d) Cytochrome complex
- Q.36** The product of the dark reaction is:
- (a) ATP (b) RuBP
(c) G_3P (d) PEP
- Q.37** For fixing 3 molecules of CO_2 in Calvin cycle, what is required?
- (a) 9 ATP and 6 NADPH_2 (b) 18 ATP and 12 NADPH_2
(c) 6 ATP and 9 NADPH_2 (d) 3 ATP and 3 NADPH_2
- Q.38** ATP formation through oxidative phosphorylation involves:
- (a) Light reactions (b) Dark reactions
(c) Chemiosmosis (d) Fermentation
- Q.39** What happens in glycolysis when fructose 1, 6-bisphosphate is converted into two 3 carbon compound?
- (a) ATP is used (b) NADH is used
(c) No ATP and NADH used (d) Both ATP and NADH produce
- Q.40** Both NADH and FADH_2 are formed during:
- (a) Glycolysis (b) The electron transport system
(c) Krebs cycle (d) Fermentation
- Q.41** Biological oxidation involves removal of hydrogen, linked with specific coenzymes and is catalyzed by:
- (a) Carboxylase (b) Hydrogenases
(c) Dehydrogenases (d) Catalases
- Q.42** Which of the following is the final acceptor of electron in respiratory chain?
- (a) Cytochrome 'a' (b) Cytochrome a_3
(c) Oxygen (d) Hydrogen
- Q.43** Starting from end products of glycolysis, how many CO_2 are produced up to the formation of succinate in a single Krebs cycle?
- (a) 2 (b) 12
(c) 6 (d) 3
- Q.44** Which one of the following represents de-phosphorylation?
- (a) Fructose 1-phosphate → Fructose 1,6-bisphosphate
(b) Fructose 1-phosphate → Fructose 6-phosphate
(c) Fructose 1,3-bisphosphoglycerate → 3-phosphoglycerate
(d) Glucose 6-phosphate → Fructose 1-phosphate
- Q.45** About 2% energy of chemical bonds of glucose is converted into ATP by:
- (a) Link reaction (b) Chemiosmosis
(c) Fermentation (d) Calvin cycle
- Q.46** Cellular respiration is essentially a/an _____ process.
- (a) Oxidation (b) Redox
(c) Reduction (d) Hydrogenation

- Q.47 Which of the following types of mammalian cell does not carry out oxidative phosphorylation?
(a) Erythrocytes (b) Neuron
(c) Oxyntic cell (d) Cardiac muscle cell
- Q.48 Some photosynthetic organisms contain chloroplasts that lack photosystem II, yet are able to survive. The best way to detect the 'lack of photosystem II' in these organisms would be:
(a) To determine if they have thylakoids in the chloroplasts
(b) To test for CO_2 fixation in the dark
(c) To test for liberation of O_2 in the light
(d) To do experiments to generate an action spectrum
- Q.49 End products of yeast fermentation, bacterial fermentation and anaerobic respiration are:
(a) Citric acid, lactic acid, carbon dioxide and water
(b) Ethyl alcohol, lactic acid, carbon dioxide and water
(c) Ethyl alcohol, citric acid and carbon dioxide
(d) Methanol, lactic acid and citric acid
- Q.50 Which one are intermediates in respiration and photosynthesis both?
(a) Ribose and heptulose (b) Glucose and galactose
(c) Glyceraldehydes and dihydroxyacetone (d) Fructose and ribulose
- Q.51 T Phages generally parasitize:
(a) *Bacillus* (b) *Pseudomonas*
(c) *E. coli* (d) Lambda phage
- Q.52 Viral genome integrated into the bacterial genome is called:
(a) Plasmid (b) Prophage
(c) Virion (d) Capsid
- Q.53 Up to 60% of adults are immune to:
(a) Mumps and measles (b) Influenza and herpes
(c) Cowpox and measles (d) Cowpox and small pox
- Q.54 Shape of head of a Bacteriophage is:
(a) Spiral (b) Pyramidal
(c) Elongated pyramidal (d) Cubical
- Q.55 Viral inflammation of parotid gland is commonly associated with:
(a) Herpes simplex (b) Small pox
(c) Mumps (d) Influenza
- Q.56 Which of these is incorrect about HIV?
(a) Envelope is lipoprotein in nature (b) Cone shaped capsid
(c) Contains one molecule of RNA (d) Two molecules of reverse transcriptase
- Q.57 Enzyme released by phage tail and helps in penetration of bacterial cell wall is:
(a) Lysozyme (b) Isozyme
(c) Lysozyme (d) Ribozyme
- Q.58 Infectious hepatitis is another name used for:
(a) Hepatitis A (c) Hepatitis B
(b) Hepatitis C (d) Hepatitis D
- Q.59 Hepatitis D in humans is caused by:
(a) Prions (b) Viroids
(c) Virus (d) Virions
- Q.60 Which part of T-cell is related with reverse transcription of HIV?
(a) Nucleus (b) Cytoplasm
(c) Ribosomes (d) Golgi apparatus

CHEMISTRY

- Q.61 An acid with molecular mass 104 contains 34.6% C, 3.85% H and rest is O. The molecular formula of acid is
(a) $\text{C}_3\text{H}_4\text{O}_4$ (b) $\text{C}_2\text{H}_2\text{O}_4$
(c) $\text{C}_2\text{H}_2\text{O}$ (d) C_2HO_2
- Q.62 2.8g of N_2 molecules contain number of chemical bonds
(a) 1.8×10^{23} (b) 1.204×10^{23}
(c) 6.02×10^{22} (d) 1.8×10^{22}
- Q.63 The total number of atoms in 9g of water are
(a) 3.01×10^{23} (b) 4.51×10^{23}
(c) 6.02×10^{23} (d) 9.03×10^{23}

- Q.64 A pair that have same number of molecules
(a) 32g O₂ and 32g N₂H₄ (b) 34g H₂S and 34g N₂H₄
(c) 30g N₂ and 30g C₂H₆ (d) 44g CO₂ and 44g CS₂
- Q.65 One gram molecule of different gases have all the following properties same at STP except
(a) Molecules (b) Moles
(c) Volume (d) Masses
- Q.66 Hydrogen and oxygen have same at STP
(a) Gram molecular weight (b) Protons in the molecules
(c) Gram molecular volume (d) Electrons in the valence shell
- Q.67 A sample of 0.1 mole of metal 'M' reacts completely with excess of chlorine to form 7.45 g of MCl. What is the atomic mass of Metal 'M'
(a) 39 g/mole (b) 23 g/mole
(c) 40 g/mole (d) 74.5 g/mole
- Q.68 Which one acts as a limiting reactant when 6g of carbon and 16 g of oxygen react to produce CO₂
(a) Carbon (b) Oxygen
(c) Carbon dioxide (d) None of these
- Q.69 Elemental analysis is performed to determine
(a) Molar mass of the compound (b) Structural formula of a compound
(c) Empirical formula of a compound (d) Mass of halogen present in a compound
- Q.70 Which one has maximum number of atoms
(a) 1g Mg (b) 1g Fe
(c) 1g Al (d) All have same atoms
- Q.71 1 a.m.u is equal to
(a) 1.661×10^{-27} kg (b) 1.661×10^{-21} kg
(c) 1.661×10^{-24} kg (d) All of these
- Q.72 Which one is incorrect relation at STP
(a) 6g of carbon = 3.01×10^{23} atoms (b) 14.2 dm³ of CO₂ = 3.01×10^{23} molecules
(c) 49 g of H₂SO₄ = 4 moles of atoms (d) 1 mole of sucrose = 45 moles of atoms
- Q.73 A compound with empirical formula C₂H₃O₂ and molecular mass 90g / mole. The molecular formula of the compound is
(a) C₆H₁₂O₆ (b) (COOH)₂
(c) C₁₂H₂₂O₁₁ (d) HCOOH
- Q.74 A limiting reactant is one which
(a) Is taken in lesser quantity in grams as compared to other reactant
(b) Gives minimum amount of product under consideration
(c) Is taken in lesser quantity in volume as compared to other reactant
(d) Gives maximum amount of the product which is required
- Q.75 21g of CaO is obtained by roasting 50g CaCO₃. What is the percentage yield of CaO?
(a) 25% (b) 50%
(c) 60% (d) 75%
- Q.76 Which of following has same number of electron as α-particle
(a) Li⁺ (b) H⁺
(c) He⁺ (d) Be²⁺
- Q.77 The last electron in the Na and K can be distinguished by
(a) Principal quantum number (b) Azimuthal quantum number
(c) Magnetic quantum number (d) Spin quantum number
- Q.78 Which contains most stable orbitals in the valence shell
(a) O²⁺ (b) N²⁺
(c) Mg²⁺ (d) S²⁺
- Q.79 In the hydrogen atom, when electron jumps from any high energy orbit to second orbit, the radiation emitted will fall in the
(a) UV region (b) Visible region
(c) I.R region (d) Microwave region
- Q.80 The atomic number of an element is sixteen. It belongs to period and group number of the periodic table respectively
(a) 3, 7 (b) 6, 3
(c) 3, 6 (d) 7, 3



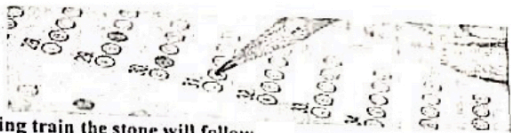
- Q.81 The value of $n = 3$. What are probable values of Azimuthal quantum number l ?
- (a) 0, 1, 2, 3 (b) 0, 1, 2
(c) 0, 1 (d) 1, 2, 3, 4
- Q.82 The limiting line of Balmer series lies in
- (a) Infrared region (b) Ultraviolet region
(c) Visible region (d) Microwave region
- Q.83 Which one orbital is bilobed with collar
- (a) $d_{x^2-y^2}$ (b) d_{z^2}
(c) d_{xy} (d) d_{yz}
- Q.84 Which of the following does NOT correctly relate the arrangement of electrons
- (a) Arrangement of sub shell is given by $(n + l)$ rule
(b) Filling of electrons in degenerate orbitals is given by Hund's rule
(c) Filling of electrons in an orbital is given by Pauli's exclusion principle
(d) Arrangement of electrons in a shell is given by octet rule
- Q.85 How many total unpaired d-electrons are present in an atom with $Z = 24$
- (a) Two (b) Five
(c) Six (d) Eight
- Q.86 Which species has same number of electrons in valence shell and penultimate (second last) shell
- (a) Na^+ (b) O^{2-}
(c) Al^{3+} (d) Cl^-
- Q.87 Number of electrons and orbitals in a shell can be determined by
- (a) $n^2, 2n$ (b) $n, 2n$
(c) $n, 2l + 1$ (d) $2n^2, n^2$
- Q.88 Which electronic configuration is not possible?
- (a) $1s^2, 2s^2, 2p^6, 2d^2, 3s^1$ (b) $1s^1$
(c) $1s^2, 2s^2, 2p^1, 2p^1, 2p^1$ (d) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2$
- Q.89 Without applying Hund's rule the electronic configuration of one of the following cannot be justified
- (a) Fluorine (b) Neon
(c) Sodium (d) Phosphorus
- Q.90 The positive rays have maximum e/m value when one of the following gas is used in discharge tube
- (a) O_2 (b) N_2
(c) F_2 (d) Cl_2
- Q.91 At a given temperature and pressure, 14g Nitrogen will have same volume as 14g of
- (a) Oxygen (b) Carbon monoxide
(c) Carbon dioxide (d) Neon
- Q.92 The value of general gas constant "R" at STP is
- (a) $1.98 \text{ J K}^{-1} \text{ mol}^{-1}$ (b) $0.0821 \text{ J K}^{-1} \text{ mol}^{-1}$
(c) $0.0821 \text{ dm}^3 \text{ atm K}^{-1} \text{ mol}^{-1}$ (d) $8.314 \text{ dm}^3 \text{ atm K}^{-1} \text{ mol}^{-1}$
- Q.93 For a given mass with initial volume 'V', if pressure is reduced to one half and absolute temperature is increased two times. The volume will become
- (a) $2V^2$ (b) $\frac{V}{4}$
(c) $4V$ (d) $6V$
- Q.94 At absolute zero, which one of the following statements is correct
- (a) All the gases become liquid (b) Molecular motion ceases
(c) Water freezes (d) All the substances become solid
- Q.95 Van der Waal's equation is reduced to general gas equation at
- (a) High temperature and low pressure (b) Low temperature and high pressure
(c) High temperature and high pressure (d) Low temperature and low pressure
- Q.96 The molecules of which gas has highest average kinetic energy at 25°C
- (a) CO_2 (b) O_2
(c) CH_4 (d) All have same

- Q.97 If temperature and pressure of a gas is increased two times, its density will become
(a) Two times (b) $\frac{1}{2}$ times
(c) Four times (d) Remains same
- Q.98 One dm^3 of each of H_2 , He , N_2 and O_2 in separate vessels at STP, have number of molecules in each.
(a) 6.02×10^{23} (b) 6.02×10^{22}
(c) 2.68×10^{22} (d) 2.68×10^{23}
- Q.99 The value of Van der Waal's constant 'a' for O_2 , N_2 , NH_3 and CH_4 are 1.36, 1.39, 4.17 and 2.25 $\text{atm} \cdot \text{dm}^6 \cdot \text{mol}^{-2}$ respectively. The gas which shows maximum deviation from ideal behavior is
(a) O_2 (b) N_2
(c) NH_3 (d) CH_4
- Q.100 A pair of gases with equal root mean square velocity at 300K is
(a) SO_2 , O_2 (b) N_2O , CO_2
(c) Cl_2 , Br_2 (d) NO , NO_2
- Q.101 The correct order of enthalpy changes of sublimation (ΔH_s), vaporization (ΔH_v) and fusion (ΔH_f) is
(a) $\Delta H_s > \Delta H_v > \Delta H_f$ (b) $\Delta H_s > \Delta H_f > \Delta H_v$
(c) (d) $\Delta H_f > \Delta H_s > \Delta H_v$
- Q.102 Vapour pressure depends upon
(a) Amount of liquid (b) Surface area
(c) Temperature (d) Shape of container
- Q.103 Heat of vaporization is minimum for
(a) HF (b) HCl
(c) HBr (d) HI
- Q.104 Naphthalene is soluble in carbon tetrachloride due to the force
(a) Dipole-dipole force (b) Dipole-induced dipole force
(c) Hydrogen bonding (d) London dispersion forces
- Q.105 Water boils at 25°C if external pressure is
(a) 323 torr (b) 700 torr
(c) 23.7 torr (d) 1489 torr
- Q.106 If we provide very large amount of heat to a liquid, its boiling point
(a) Remains the same (b) Increases
(c) Decreases (d) Varies abnormally
- Q.107 The chloroform and acetone are miscible due to hydrogen bonding. The type of force between chloroform molecules is
(a) Hydrogen bonding (b) Dipole-dipole force
(c) Van der Waals's force (d) Dipole induced dipole force
- Q.108 Moving from 4°C to 0°C , the density of H_2O
(a) Increases (b) Decreases
(c) 1st increase then decrease (d) Remains same
- Q.109 Which of the followings does not match
(a) H_2O and Na^+ \rightarrow Ion dipole force
(b) CH_3COCH_3 and $\text{CH}_3\text{COCH}_3 \rightarrow$ dipole-dipole force
(c) HCl and $\text{Ar} \rightarrow$ Dipole-dipole force
(d) $\text{C}_6\text{H}_{12}\text{O}_6$ and $\text{H}_2\text{O} \rightarrow$ Hydrogen bonding
- Q.110 Which order of strength of forces is correct
(a) Dipole-Dipole Interaction > Debye forces > London forces > Hydrogen Bonding
(b) Hydrogen Bonding > Dipole-Dipole Interaction > London forces > Debye forces
(c) Dipole-Dipole Interaction > Hydrogen Bonding > London forces > Debye forces
(d) Hydrogen Bonding > Dipole-Dipole Interaction > Debye forces > London forces
- Q.111 Which of the following is an example of molecular solid
(a) Aluminium nitride (b) Glucose
(c) Sodium sulphate (d) Graphite

- Q.112 Copper metal can be drawn into wires because
 (a) Copper atoms are held together by true covalent bonds
 (b) Copper has unique electronic configuration
 (c) Copper has variable valency
 (d) Copper atoms are held together by non-directional metallic bonds
- Q.113 NaCl and CsF have same geometry because
 (a) Their cations belong to 1A group (b) Their anions belong to VIIA group
 (c) Both are soluble in water (d) They have same radius ratio
- Q.114 The compound having highest lattice energy will be
 (a) NaCl (b) LiCl
 (c) KCl (d) CsCl
- Q.115 Crystalline solids in which the particles forming the crystals are positively and negatively charged ion are known as
 (a) Covalent solids (b) Ionic solids
 (c) Metallic solids (d) Molecular solids
- Q.116 The co-ordination number of each Na^+ in the crystal of sodium NaCl is
 (a) 2 (b) 4
 (c) 6 (d) 8
- Q.117 In a simple cubic unit cell an atom at the corner contributes to the unit cell
 (a) $\frac{1}{6}$ part (b) $\frac{1}{2}$ part
 (c) $\frac{1}{4}$ part (d) $\frac{1}{8}$ part
- Q.118 Which types of solids generally have high melting points
 (a) Ionic crystals (b) Network covalent crystals
 (c) Molecular crystals (d) Metallic crystals
- Q.119 The particle motion in solids is
 (a) Vibratory as well as rotatory (b) Only vibratory
 (c) Only rotatory (d) Vibratory as well as translatory
- Q.120 The smallest part of the crystal lattice has all the characteristics features of the entire crystal and is known as
 (a) Crystal lattice (b) Unit cell length
 (c) Crystallite (d) Unit cell

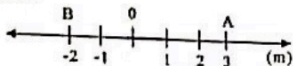
PHYSICS

- Q.121 A racing car accelerates with following average speeds 5ms^{-1} for 6 sec, 10ms^{-1} for 2 sec, 15ms^{-1} for 2 sec what is overall average speed of car
 (a) 5ms^{-1} (b) 8ms^{-1}
 (c) 6ms^{-1} (d) 7ms^{-1}
- Q.122 Two bodies are projected with same velocity at 30° and 60° to horizontal the ratio of their height is
 (a) 1:1 (b) 1:3
 (c) 3:1 (d) 1:2
- Q.123 At the top of trajectory of projectile motion acceleration is
 (a) 0 (b) Maximum
 (c) Minimum (d) g
- Q.124 The law of conservation of linear momentum is consequence of Newton's
 (a) 1st law (b) 3rd law
 (c) 2nd law (d) Law of gravitation
- Q.125 If air resistance is ignored the horizontal motion of projectile is with
 (a) Constant acceleration (b) Constant deceleration
 (c) Constant velocity (d) Variable velocity
- Q.126 Horse power is a unit of
 (a) Energy (b) Power
 (c) Intensity (d) Efficiency
- Q.127 Which of the following is not the unit of energy?
 (a) Watt hour (b) Joule
 (c) erg (d) Kilowatt

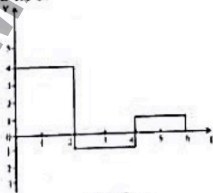


- Q.128 A stone is released from moving train the stone will follow
(a) Hyperbolic path (b) Straight path
(c) Parabolic path (d) Circular path
- Q.129 The ballistic missiles are used for _____ range
(a) Long (b) Medium
(c) Short (d) May A or C
- Q.130 If a body of 1kg raised through 1m height work done will be
(a) 5 J (b) 1J
(c) 0.1J (d) 10J
- Q.131 Power is dot product of
(a) Force and displacement (b) Force and momentum
(c) Force and velocity (d) Force and time
- Q.132 1MWh is equal to _____ joule.
(a) 3.6×10^{10} (b) 3.6×10^6
(c) 3.6×10^9 (d) 3.6
- Q.133 Angle between linear and angular velocity is
(a) 180° (b) 90°
(c) 0° (d) 360°
- Q.134 A bucket filled with water is revolved in vertical circle of radius 4m. speed of bucket at highest point just to avoid fall of water is
(a) 2 m s^{-1} (b) 2.5 m s^{-1}
(c) 4 m s^{-1} (d) $2\pi\text{ m s}^{-1}$
- Q.135 The ratio of angular speeds of minute and hour hand of a watch is
(a) 1:12 (b) 1:1
(c) 12:1 (d) 1:24
- Q.136 The engine of an inter-city train travelling at 50 ms^{-1} delivers powers of 2 MW what is force exerted by engine
(a) $4 \times 10^4\text{ N}$ (b) $4 \times 10^3\text{ N}$
(c) $1 \times 10^5\text{ N}$ (d) $1 \times 10^6\text{ N}$
- Q.137 An object travels at constant speed around a circle of radius 1m in 1 sec what is magnitudes of its acceleration
(a) 0 (b) $2\pi\text{ ms}^{-1}$
(c) 1 m s^{-2} (d) $4\pi^2\text{ ms}^{-2}$
- Q.138 If R is the max range of projectile then greatest height attained is
(a) R (b) $\frac{R}{4}$
(c) $R/2$ (d) 2R
- Q.139 An aeroplane moving horizontally with 50 ms^{-1} drops a packet at 490 m height. Its time of flight is
(a) 50 sec (b) 10 sec
(c) 40 sec (d) 20 sec
- Q.140 For long range and greater precision
(a) Powered (b) Powered and guided missile are used
(c) Remote control guided (d) Unpowered missile are used
- Q.141 A 500 kg car takes a round turn of radius 50 m with a velocity of 36 km/hr. The centripetal force is
(a) 250 N (b) 1000 N
(c) 750 N (d) 1200 N
- Q.142 A ball of mass 0.25 kg attached to the end of a string of length 1.96 m is moving in a horizontal circle. The string will break if the tension is more than 25 N. What is the maximum speed with which the ball can be moved?
(a) 14 m/s (b) 3.92 m/s
(c) 3 m/s (d) 5 m/s

- Q.143 As shown in the figure a particle moves from o to A, and then A to B. Find pathlength (distance) and displacement.

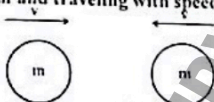


- (a) 8m, -2m
(c) 8m, -8m
(b) 2m, -2m
(d) 2m, 2m
- Q.144 The amount of work done by a labourer who carries "n" bricks, each of mass 'm', to the roof of a house whose height is "h"
- (a) nmgh
(c) Zero
(b) $\frac{mgh}{h}$
(d) $\frac{ghn}{m}$
- Q.145 Work done by gravity when P.E of body is increased is
- (a) Positive
(c) Negative
(b) Zero
(d) Both positive and negative
- Q.146 Range of projectile is same as that for 0 and 20. The value of θ is:
- (a) 15°
(c) 45°
(b) 30°
(d) 60°
- Q.147 If linear momentum of body is increased by 1.5%, its kinetic energy increases by.....%
- (a) 0%
(c) 3%
(b) 10%
(d) 5%
- Q.148 A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is:
- (a) Zero
(c) g, down
(b) g, up
(d) 2g, down
- Q.149 The S.I. unit of angular displacement is:
- (a) Meter
(c) Kilometer
(b) Radian
(d) Centimeter
- Q.150 If a projectile is thrown with 19.6m/s velocity at 30° with x-axis, time taken to reach highest point?
- (a) 1 sec
(c) 2 sec
(b) 3 sec
(d) 4 sec
- Q.151 The velocity time graph of a body moving in a straight is shown in fig. The displacement travelled by the body in 6 seconds are



- (a) 12m
(c) 10m
(b) 8m
(d) 2m
- Q.152 A moving body posses impulse when
- (a) Velocity constant
(c) No force acts on it
(b) Momentum constant
(d) Has acceleration
- Q.153 The equation of motion are applicable when
- (a) Velocity remain constant
(c) Acceleration remains constant
(b) Momentum remain constant
(d) Torque is zero
- Q.154 Which of given is correct equation for instantaneous velocity of projectile
- (a) $v_m = \sqrt{v_x^2 + v_y^2}$
(c) $v_m = \sqrt{v_x^2 + g^2 t^2 + v_x \sin \theta}$
(b) $v_m = \sqrt{v_x^2 + g^2 t^2 + g t \sin \theta}$
(d) $v_m = \sqrt{v_x^2 + g^2 t^2 - 2 v_x g t \sin \theta}$

- Q.155 Potential energy of the projectile at the highest point of the path, when projected with a velocity u at an angle θ is:
- (a) $\frac{1}{2}mu^2\sin^2\theta$ (b) $\frac{1}{2}mu^2\cos^2\theta$
 (c) $\frac{1}{2}mu^2$ (d) $\frac{1}{2}mu^2\sin^2 2\theta$
- Q.156 A force $2F$ acting on 10 kg produces acceleration 60ms^{-2} a force $5F$ acting on $M\text{ kg}$ produces acceleration 50ms^{-2} what is M
- (a) 20 kg (b) 30 kg
 (c) 5 kg (d) 3 kg
- Q.157 An object of mass 100 g is falling freely under gravity. Consider there is no air friction, then after 2 s , net force on it become
- (a) 1 N (b) 9.8 N
 (c) 98 N (d) Zero
- Q.158 Two similar spheres, each of mass m and traveling with speed v , are moving towards each other



The spheres have a head-on elastic collision. Which statement is correct?

- (a) The spheres stick together on impact.
 (b) The total kinetic energy before impact is zero
 (c) The total kinetic energy after impact is mv^2
 (d) The total momentum before impact is $2mv$
- Q.159 Displacement time graph is shown in figure below acceleration will be
-
- The graph shows displacement 'd' on the vertical axis and time 't' on the horizontal axis. A straight line starts from the origin (0,0) and passes through the point (2, 10). The slope of the line is 5, which represents the acceleration.
- (a) 5 ms^{-2} (b) 10 ms^{-2}
 (c) 2.5 ms^{-2} (d) 0
- Q.160 Two bodies are projected with same velocity. Angle of 1^{st} body with horizontal is 30° and of 2^{nd} body with y-axis is 30° ratio of their height
- (a) 1:1 (b) 1:2
 (c) 1:3 (d) 3:1
- Q.161 Two balls have K.E ratio 2 : 1 and masses ratio 2 : 1. The ratio of their momentum is
- (a) 2 : 1 (b) 4 : 1
 (c) 1 : 2 (d) 1 : 4
- Q.162 A car runs at constant speed on a circular track of radius 100 m taking 62.8 sec on each lap. What is the average speed and average velocity on each complete lap?
- (a) Velocity 10 m/sec , speed 10 m/sec (b) Velocity zero, speed zero
 (c) Velocity zero, speed 10 m/sec (d) Velocity 10 m/sec , speed zero
- Q.163 A force of 10 N acts on a body of mass 2 kg for 1 m distance. The K.E. obtained by the body is
- (a) 20 J (b) 5 J
 (c) 10 J (d) 2.5 J
- Q.164 $(60\hat{i} + 15\hat{j} - 3\hat{k})\text{ N}$ force produces velocity $(2\hat{i} - 4\hat{j} + 5\hat{k})\text{ m/s}$ in a particle. The value of power at that time will be:
- (a) 95 W (b) 45 W
 (c) 75 W (d) 100 W
- Q.165 Electron, proton, deuterium and α -particle have same K.E. Which of them has highest momentum?
- (a) α -particle (b) Deuterium
 (c) Proton (d) Electron

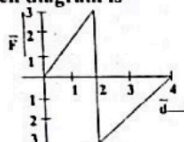
Q.166 A motorcycle travelling at 25 m/s develops 3 kW power. What is the resistance experienced by motorcycle?

- (a) 100 N (b) 200 N
(c) 120 N (d) 220 N

Q.167 Potential energy can be defined only for

- (a) Conservative forces (b) Both
(c) Non-conservative forces (d) None

Q.168 The negative work done in the given diagram is



- (a) 4J (b) 3J
(c) -3J (d) 12J

Q.169 A block of mass 100 g slides across a frictionless floor with speed 3 m/s. The block strikes with a wall and bounce back with a speed 3 m/s in opposite direction. Net work done on block is

- (a) 3 J (b) Zero
(c) 6 J (d) -6 J

Q.170 Slope of work time graph is equal to

- (a) Displacement (b) Power
(c) Acceleration (d) Energy

Q.171 The input power to a motor is 300 W. In 20s it lifts a load of 400 N through a height of 6.0 m. What is the efficiency of the motor?

- (a) 12% (b) 25%
(c) 40% (d) 75%

Q.172 The diagram shows the distance-time graph of a car.



The car is travelling along a straight road up a hill. Which quantity for the car is constant and greater than zero?

- (a) Acceleration
(c) Gravitational potential energy
(b) Kinetic energy
(d) Resultant force

Q.173 Centripetal force may be equal to

- (a) $\frac{mv^2}{r}$ (b) $\frac{pv}{r}$
(c) $\frac{p^2}{mr}$ (d) All of these

Q.174 The angular velocity of a wheel increases from 100 rps to 300 rps in 10s. The number of revolutions made during that time is

- (a) 600 (b) 1500
(c) 1000 (d) 2000

Q.175 If a body of mass m is rotating in a circle of radius r with frequency of rotation " f " then centripetal force acting on it is

- (a) $2\pi mrf$ (b) $4\pi^2 mrf$
(c) $4\pi^2 mrf^2$ (d) $\pi^2 mrf^2$

Q.176 A body of momentum mv collides with a wall elastically its change in momentum is

- (a) mv (b) 0
(c) $-2mv$ (d) mv

- Q.177 With the help of $v-t$ graph we can find
 (a) Acceleration (b) Force
 (c) Distance (d) Both A and B
- Q.178 A 4 kg body is thrown vertically upward from the ground with a velocity of 5 ms^{-1} . Its kinetic energy just before hitting the ground is
 (a) 25 J (b) 50 J
 (c) 75 J (d) 100 J
- Q.179 A car is taking a turn on a level road. It may be thrown outwards because of the
 (a) Reaction of the ground (b) Friction force
 (c) Weight (d) Lack of centripetal force
- Q.180 A particle is moving along a circular path of radius 'R' with uniform speed of 1 ms^{-1} , the time taken to complete 1 rotation is _____ sec.
 (a) πR (b) $\frac{\pi R}{2}$
 (c) $2\pi R$ (d) $4\pi R$

ENGLISH

SPOT THE ERROR:

In the first type of sentences, some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected.

- Q.181 The one-fourth of mankind enclosed in one of the largest countries were brought out of the memory attic, with a loud bang.
 (a) (b) (c) (d)
- Q.182 To be influencing those who are going to grow up and matter to the world was such fascinating to Katherine that she started loving Chips.
 (a) (b) (c) (d)
- Q.183 The number of orders that are still to be executed are estimated at nearly a hundred.
 (a) (b) (c) (d)
- Q.184 It was on this steep slope for my father once made me a little wooden plough.
 (a) (b) (c) (d)
- Q.185 If Sarah knew that her colleagues were going to be so difficult, she would never have taken the job.
 (a) (b) (c) (d)

CORRECTION:

In each of the following questions, four alternative sentences are given. Choose the CORRECT one and fill the Circle corresponding to that letter in the MCQ Response Form.

- Q.186
 (a) Though the question of safety is settled, we can move on the other matters.
 (b) If the question of safety is settled, we can move on the other matters.
 (c) Therefore the question of safety is settled, we can move on the other matters.
 (d) Once the question of safety is settled, we can move on the other matters.
- Q.187
 (a) The local counsel has decided not to allocate their funds for the project.
 (b) The local council have decided not to allocate their funds for the project.
 (c) The local counsel have decided not to allocate their funds for the project.
 (d) The local council has decided not to allocate their funds for the project.
- Q.188
 (a) The lady and her dog which came yesterday have come again today.
 (b) The lady and her dog who came yesterday have come again today.
 (c) The lady and her dog that came yesterday have come again today.
 (d) The lady and her dog that which came yesterday have come again today.

Q.189

- (a) The vegetables that the old man grew in his secret garden was better flavor because of the sunshine in the clearing.
(b) The vegetables that the old man grew in his secret garden were better flavor because the sunshine in the clearing.
(c) The vegetables that the old man grew in his secret garden were better flavored because of the sunshine in the clearing.
(d) The vegetables that the old man grew in his secret garden was better flavored because the sunshine in the clearing.

Q.190

- (a) Why don't you have a little holiday seeing you've finished your assignment?
(b) Why don't you have a little holiday: seeing you've finished your assignment?
(c) Why don't you have a little holiday; seeing you've finished your assignment?
(d) Why don't you have a little holiday, seeing you've finished your assignment?

Sentence Completion:

Fill in the blanks with appropriate word.

Q.191 From the moment I read that book I was _____ with the heroism and gallantry and poetry of Collins's life.

- (a) Enchanted (b) Entangled
(c) Cherished (d) Cheated

Q.192 For a split second, I thought about ignoring the call, but something _____ me to answer.

- (a) Dispelled (b) Compelled
(c) Dissuaded (d) Dispersed

Q.193 You will also have a constant reminder of your _____ actions through your own and your partner's permanent injuries.

- (a) Appalling (b) Pushing
(c) Thrilling (d) Cushioning

Q.194 Relevant staff then need to be _____ and the extent and quality of the team's skills base assessed.

- (a) Dejected (b) Talked
(c) Ignored (d) Appraised

Q.195 The artist varies his technique, sometimes painting lyrically, sometimes _____, with a near garish palette.

- (a) Smoothly (b) Causally
(c) Crudely (d) Softly

Synonyms

Choose the word that is most nearly **SIMILAR** in meaning to the word in capital letters.

Q.196 **APPARENTLY**

- (a) Frequently (b) Prescriptively
(c) Faithfully (d) Ostensibly

Q.197 **ALAS**

- (a) Inopportunately (b) Alias
(c) Favorably (d) Alien

Q.198 **DISGUISED**

- (a) Determined (b) Shrouded
(c) Shuddered (d) Detrimental

Antonyms

Choose the word **OPPOSITE** in meaning to **CAPITALIZED** word given above.

Q.199 **CURIOUS**

- (a) Officious (b) Probing
(c) Dispirited (d) Offensive

Q.200 **DISPENSING**

- (a) Begrudging (b) Expanding
(c) Providing (d) Expensing

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